

Having thus found a way of representing stream lines by colour bands, various electrical problems, and problems connected with the flow of heat, can be solved in cases

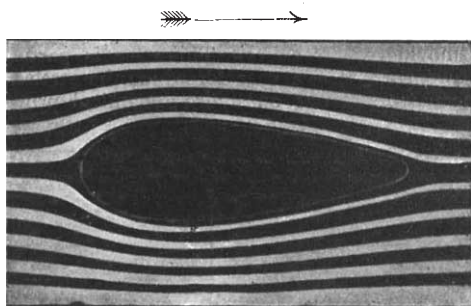


FIG. 9.—Section of screw shaft strut (broad colour bands in thin sheet).

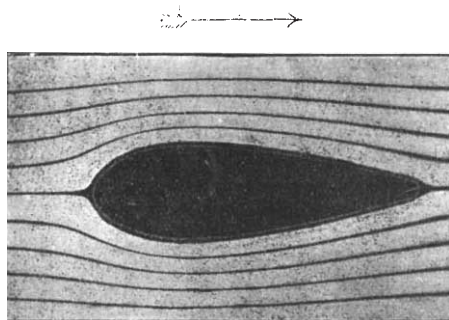


FIG. 10.—Section of screw shaft strut (narrow colour bands in thin sheet).

where it would be impossible to obtain direct mathematical solutions. It is sufficient for the present purpose to give one or two illustrations of the application of the method to problems of interest connected with the flow

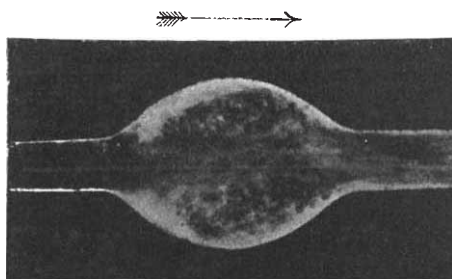


FIG. 11.—Sinuous motion in gradually enlarging and contracting channel (thick sheet).

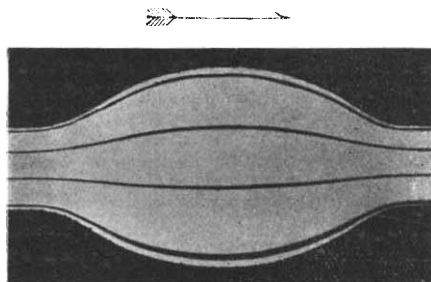


FIG. 12.—Colour bands in gradually enlarging and contracting channel (thin sheet).

of water. Thus, Figs. 9 and 10 illustrate the flow respectively in the case of broad and narrow stream bands round a section of the twin screw strut of one of Her Majesty's cruisers. This might of course be the section of a ship-shaped vessel moving through the water, and as

is well known the width apart of the different stream lines would indicate the pressure and velocity in the fluid at every point. Thus stream lines can be obtained in such a case representing a process which for this form of section it would be practically impossible to do by any mathematical process. Figs. 11 and 12 illustrate the flow of water through a passage which gradually enlarges and then contracts. The former case represents the flow under ordinary conditions with the thick sheet of water; the latter case, Fig. 12, being the flow of the colour bands moving in a very thin sheet of water. One more case may be given even more remarkable than any of the foregoing, that is the case of a sudden enlargement of the section of a pipe. Fig. 13 represents the ordinary case of a thick sheet of water in which the eddies and whirls plainly indicate why it is that such a large loss of energy occurs under these conditions in a pipe; while Fig. 14 shows how a perfectly incompressible and frictionless fluid would flow under the same conditions. This is, however, actually what occurs with a thin sheet of water with suitably arranged colour bands.

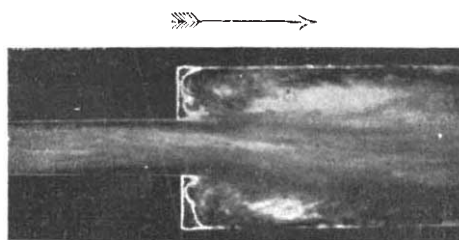


FIG. 13.—Sudden enlargement (thick sheet).

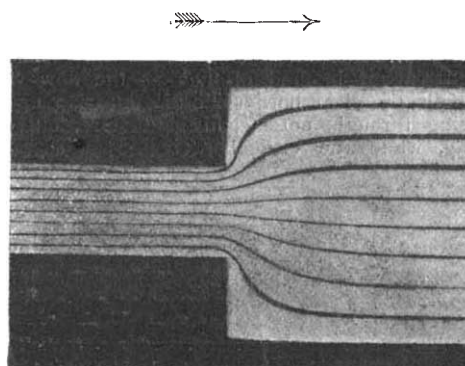


FIG. 14.—Sudden enlargement (thin sheet).

It may be well to remark that all the figures in this article are actual reproductions of photographs of flowing water, which have all been projected on a screen by means of a lantern at the two recent meetings of the Institution of Naval Architects. H. S. HELE-SHAW.

FORTHCOMING MEETING OF THE BRITISH ASSOCIATION.

THE preparations in Bristol for the meeting of the British Association on September 7 proceed apace, and local interest is now thoroughly aroused. The material for the handbook is nearly all in the hands of the editor (Dr. Bertram Rogers), and most of it in type. Among the contributors we note the names of E. J. Lowe, F.R.S. (Meteorology), C. Lloyd Morgan (Geology and Prehistoric Archaeology), A. Bulleid (Glastonbury Lake Village), A. T. Martin (Roman Archaeology), J. Latimer (History), J. R. Bramble (Architecture), Dr. D. S. Davies (Sanitation), J. W. White (Botany M.

McCurich (Docks and Tides), J. Holman and H. J. Spear (Economics).

It is hoped that the representation from Canada will be a feature of the meeting, and that many of those who contributed so largely to the success of the Toronto meeting will take this opportunity of paying a return visit. Committees with a view to furthering this object have been formed in Toronto under the presidency of Prof. Macallum, and in Montreal under the presidency of Prof. Bovey. It is hoped that the Mayor and the President of the Board of Trade in Toronto, the Minister of Education (Hon. G. W. Ross), the Secretary of the Royal Society of Canada (Dr. J. G. Bourinot, C.M.G.), the President of the Canadian Pacific Railway (Sir W. Van Horne, K.C.M.G.), and other distinguished guests will be present at the meeting. Among the names of those who are coming from the United States we note the names of Profs. Henry F. Osborn, J. W. Langley, H. P. Bowditch, R. A. Fessenden, R. H. Thurston, and J. Mark Baldwin. From the Continent among those of other eminent visitors are the names of Profs. A. von Kölliker, Ernest Hæckel, Gustav Gilson, and Leo Errara, Dr. Paul Topinet, Prof. V. Dwelshauvers-Dery, Prof. Hugo Kronecker, and M. C. de Candolle.

Arrangements are in progress for a biological exhibit at the Clifton Zoological Gardens. Lord Llangatock has, we understand, consented to be the president of a representative honorary committee, and Dr. A. J. Harrison is chairman of the working committee of management. Tanks are being constructed, and arrangements made for an exhibit from the Marine Biological Association's station at Plymouth.

The provisional arrangements for excursions are as follows. Saturday, September 10: (1) Bath; (2) Aust Cliff, with especial reference to geology; (3) Severn Tunnel; (4) Stanton Drew, and Sutton Court, returning over Dundry Hill; (5) Cheddar, *via* Yatton, Wrington and Burrington Combe; (6) Avonmouth Docks, including a steamer excursion past Clevedon, Weston, the Holmes, Barry, and Cardiff; (7) Raglan Castle and Tintern Abbey; and (8) Bradford-on-Avon. Thursday, September 15: (1) the Bristol Waterworks; (2) Tortworth, by special invitation of Lord Ducie, for geologists; (3) Wells and Glastonbury, including the Lake Village; (4) Nailsea and Stroud, including Stonehouse, the Stanley Cloth Mills and Dye Works, Dudbridge, Minchinhampton, and Frocester Court; (5) Bowwood, including Avebury and Silbury; (6) Longleat and Sheerwater; (7) the Swindon Railway Works; and (8) Salisbury, Stonehenge and Amesbury. Offers of hospitality in connection with nearly all these excursions have been received and gladly accepted. It is proposed to conclude with a longer excursion, starting on Friday, September 16, to Exeter, Torquay, Dartmouth and Plymouth, returning over Dartmoor.

CITY BANQUET TO THE MEDICAL PROFESSION.

AT the Mansion House on Wednesday in last week, the Lord Mayor gave a banquet to the Presidents of the Royal College of Surgeons and Royal College of Physicians and leading members of the medical profession. This was the first occasion upon which the hospitality of the Mansion House has been extended to the medical profession as such, and a very large and distinguished company was present in response to the Lord Mayor's invitation. Lord Lansdowne, Secretary of State for War, was one of the guests, and in responding to a toast he announced that the Government proposed to make several concessions with regard to the rank of medical officers in the Army. It is proposed to form—

Corps—a Royal Army Medical Corps, the officers of which will bear the same military titles as other officers of the Army. These concessions have been received with great satisfaction by the medical profession, and they will doubtless lead to a marked increase in the number of candidates for the Army medical service. We give below a few extracts from some of the speeches made at the banquet.

In the course of his remarks, Lord Lansdowne spoke as follows:—

We are now about to deal with the large question in which I know the profession takes a deep interest—the question of the status and rank of the medical officers in the army. I have heard it said, Is not the title of "Doctor" or "Surgeon" a title by itself which any one might be proud to wear? But in the army rank means a great deal. It is the outward and visible sign of that authority and consideration with which the place of a man is clearly defined and designated, and it is necessary in the military profession that a man should have a proper military stamp. Let me say in half a dozen words how it is that we intend to deal with this question. We have made in former years various attempts to solve this question of titles by means of ingenious expedients, but the results have not been very satisfactory. In some cases we have, I think, invented titles which for cumbrousness and cacophony would be hard to beat. We now propose that the Army Medical Staff and the Army Medical Corps should be formed into one corps. The titles used shall be the simple, short, intelligible titles to which we are all accustomed. We propose to give the corps military titles up to and inclusive of the rank of Colonel. I have received some forcible hints that our scheme will be unsuccessful unless we proceed to the rank of General. But we in future intend to limit the rank of General to a very restricted number of officers, all of whom will be required to hold certain specific appointments carrying with them general command in the army, and they will be required to command troops, if necessary, in the field. I feel quite sure that it is not intended that any departmental officers shall be given the rank of General under this scheme. Her Majesty the Queen, whose good will towards the profession is well known, has signified her pleasure that the new corps shall be called the Royal Army Medical Corps.

The Lord Mayor, in proposing the toast of "The Medical Profession," remarked: I feel a peculiar pleasure in proposing that toast, because I think that this is the first occasion on which it has been proposed within these walls. I am delighted to welcome you here to-night in the name of the citizens of London. I welcome you for more reasons than one. In the first place I welcome you because for many generations past you have been intimately associated with the City of London. I believe that the Royal College of Physicians commenced in the City of London in 1518. The Royal College of Surgeons was intimately associated with one of our ancient City guilds—I refer to the Barber Surgeons Company. There is another company connected with your profession, also one of the livery companies, which has its residence in the City of London at the present time; and we members of the Corporation welcome you heartily as having some connection with us both in times past and at the present time.

In replying to the toast, Sir Samuel Wilks (President of the Royal College of Physicians of London) expressed the satisfaction of the profession at Lord Lansdowne's statement. Referring to the historical connection touched upon by the Lord Mayor, he said: There was a time when the two Colleges were City companies, and at that time they were under the jurisdiction of the City and of the Lord Mayor; the same, I believe, applied to the other cities of Dublin and Edinburgh. The Physicians and Surgeons existed nearly 500 years ago as distinct companies in the time of Henry VI., and at that time they were closely connected with the Corporation of London, and I believe they had to get their licence from the Lord Mayor. The Lord Mayor of that time had a supervision over the instruments of the Surgeons and also over another class of persons connected with the Surgeons whose names I will not mention, although the Lord Mayor has done so. One reads in books how often they had to fine these members of the College in sums of 6s. 8d. and 3s. 4d. for shaving polls and trimming beards on a Sunday. Subsequently came the charter of the College of Physicians which we obey at the present time, and twenty years after that came the charter given by Henry VIII. to the Surgeons. The